

# Scott AVIATION CORP.

LANCASTER NEW YORK U.S.A.

## OVERHAUL MANUAL WITH ILLUSTRATED PARTS LIST

### OXYGEN SHUT OFF VALVE ASSEMBLY

#### 1. General

- A. This manual provides overhaul instructions with illustrated parts list for part numbers 8999 and 8999-1, -3, -5, and -7 (see Figure 1) Oxygen Shut Off Valve Assemblies.
- B. The valves covered by this manual are intended for similar applications. They differ in valve inserts, levers, name plates, and the inclusion of spring latch on the -3, -5, and -7 models.

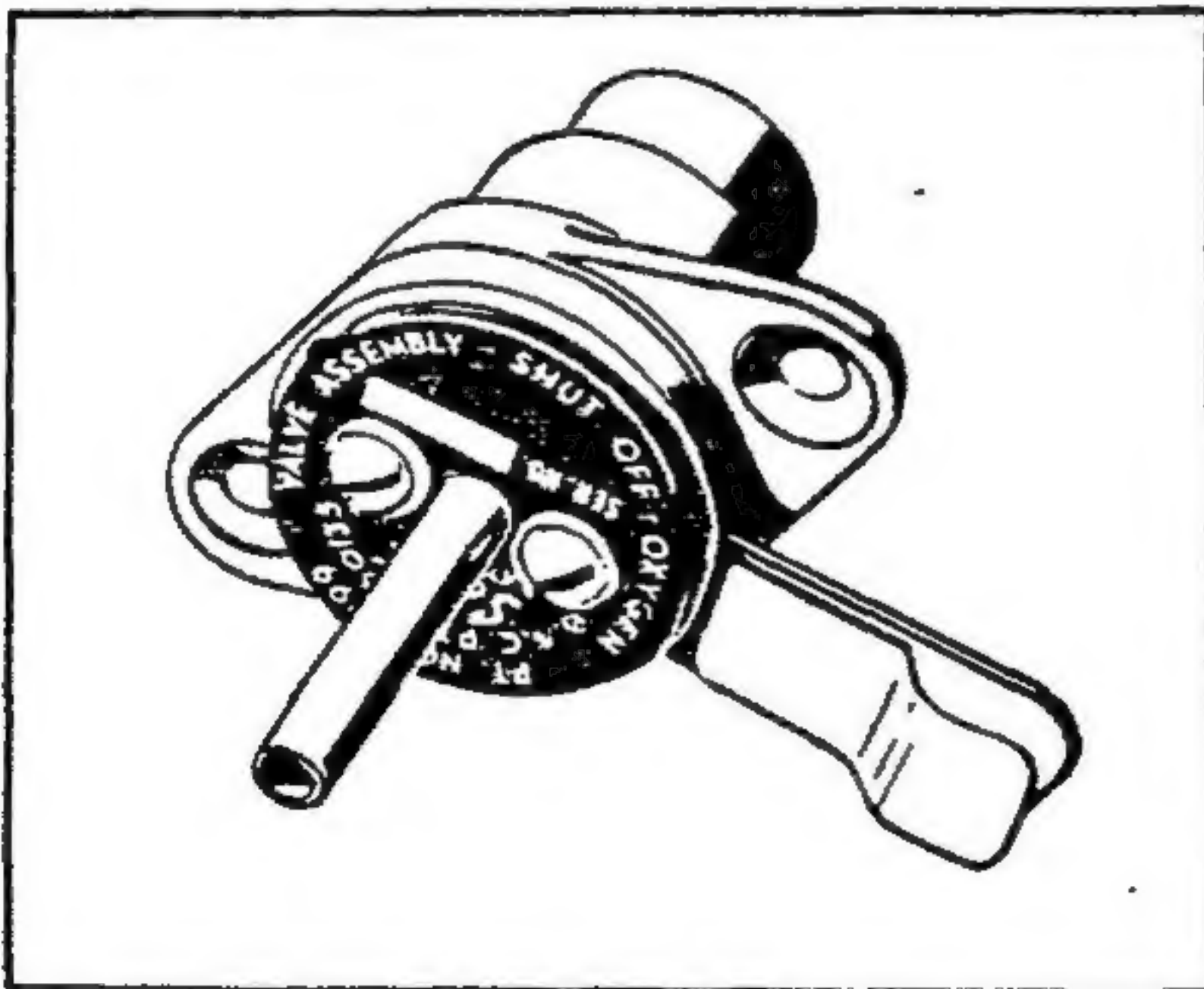
#### 2. Description and Operation

##### A. Purpose of Equipment

- (1) The valve assemblies are manually operated, on-off oxygen valves which provide a metered flow of oxygen for breathing equipment. They are designed to provide proper flows with an inlet pressure of 20 to 50 psi.

##### B. Typical Installation

- (1) A typical pressurized cabin installation of the valves is shown in Figure 2. An oxygen source consisting of a series of high pressure oxygen cylinders (1) is connected through two oxygen system release valves (6) and (7) and a regulator (5) to oxygen shut off



valve assembly (8) mounted in the passenger mask compartment. When the release valves are opened, oxygen flows to and opens the passenger mask compartments through a pressure operated latch assembly. The passenger masks in this compartment drop in front of the passenger, thus becoming available for use. The inlet hose of each passenger mask is attached to a shut off valve assembly lever, and when the mask is pulled to the passenger's face, the lever is pulled downward by the mask hose. This opens the valve and a metered supply of oxygen flows to the mask.

Part Number 8999 Oxygen Shut  
Off Valve - Figure 1

H-84



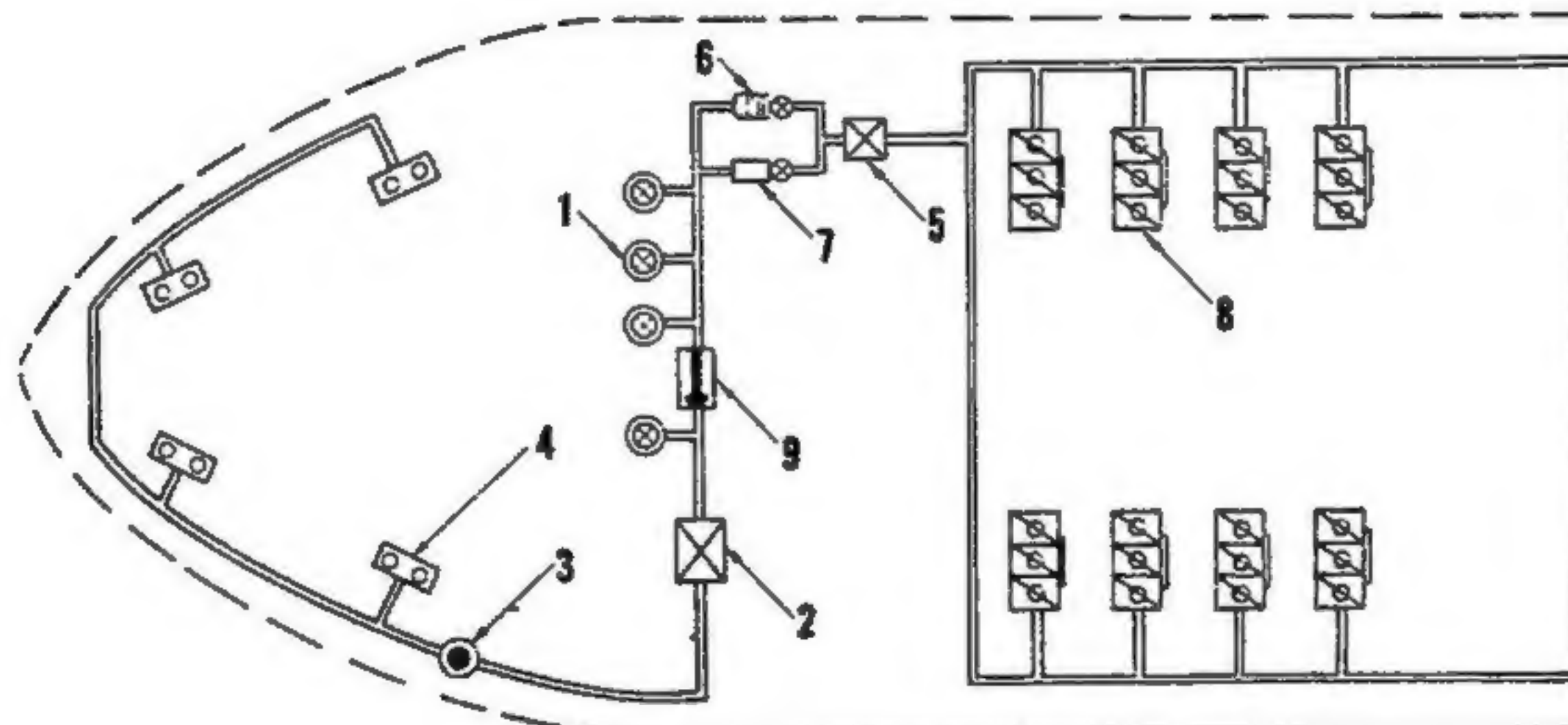
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C. Operation (see Figure 3)

- (1) Oxygen enters the valve at port (1) and flows into the valve housing. When the valve is open, oxygen flows from the housing through the hole in piston (2), through orifice (4) and out through valve insert (5). In the closed position, flow is prevented as the hole in piston (2) is sealed by valve stem assembly (6).
- (2) The valve is opened or closed by suitable rotation of valve lever (8). Rotation of the valve lever is transmitted to piston (2) which acts as a cam. Depending on position, it will either depress plunger (10), thus opening the valve, or allow plunger (10) to rise by spring pressure. The latter action causes valve stem assembly (6) to seal the opening in piston (2), thus closing the valve.

3. Disassembly (see Figure 5)

NOTE: The instructions listed herein apply to part numbers 8999, 8999-1, -3, -5 and -7. Refer to the index of Figure 5 for part variations between the valves.



- |   |  |
|---|--|
| 1. High Pressure Oxygen Source with Slow Opening Valves | 6. Aneroid Operated Oxygen System Release Valve                |
| 2. Oxygen Pressure Reducing Regulator                   | 7. Electrically Operated Oxygen System Release Valve           |
| 3. Slow Opening Line Valve                              | 8. Rotary Valve Assembly Mounted in Passenger Mask Compartment |
| 4. Diluter Demand Regulators                            | 9. Check Valve   |
| 5. Automatic Constant Flow Pressure Regulator.          |  |

Typical Installation

Figure 2

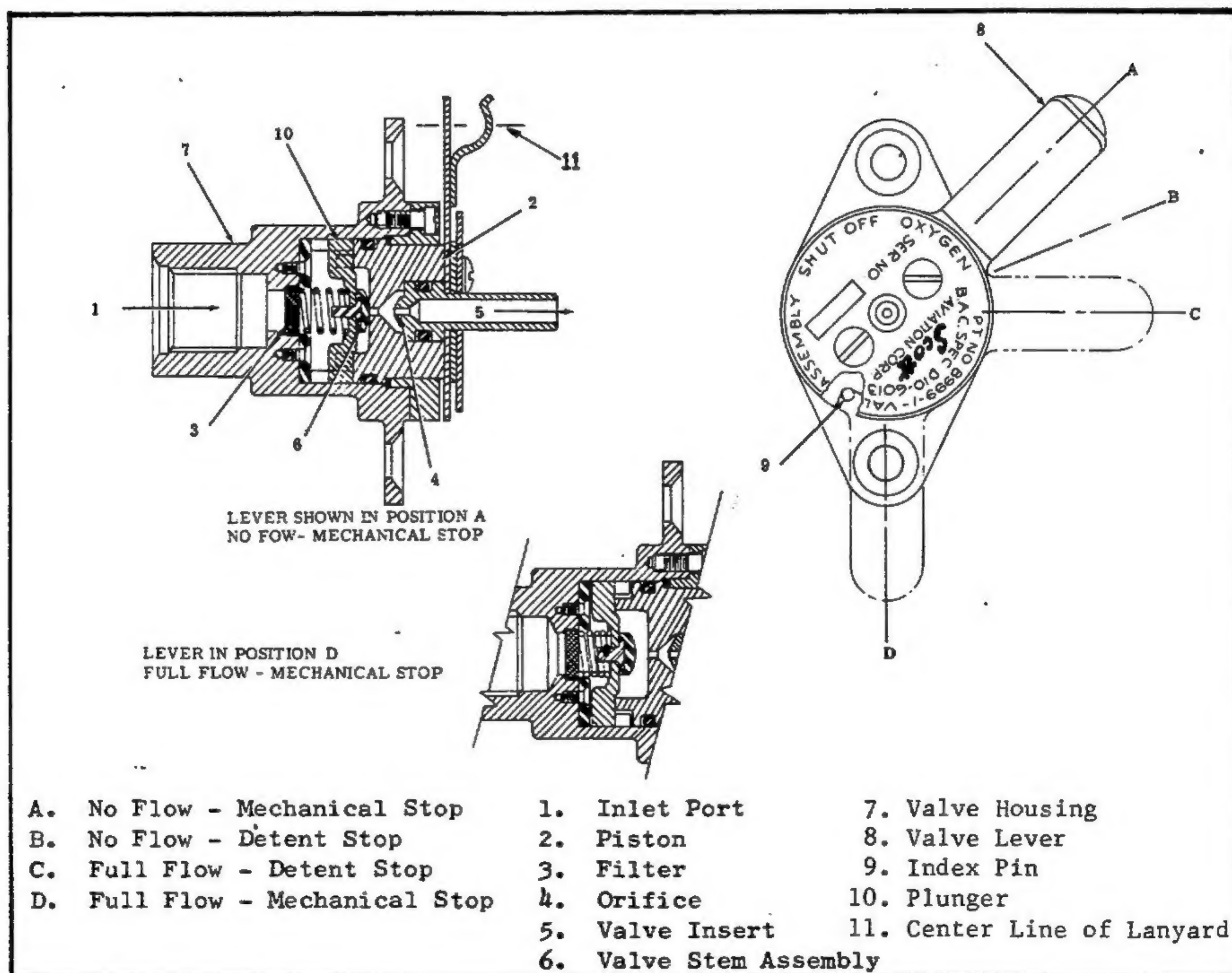


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- A. Remove cap plugs (1) and (2).
- B. Remove screws (7) and washers (8).
- C. Lift name plate (3), spacer (4) and valve lever (5) off the assembly.
- D. Lift spring latch (6) off the -3, -5, and -7 models.
- E. Pull valve insert (9) out of piston (15) and remove preformed packing (10).
- F. If necessary to replace pin (13), pull the pin out of bearing retainer (11). If this fails, cut the pin off flush with the retainer and drill the remainder out of the retainer.



Valve Cross Sections and Valve Positions

Figure 3



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- G. Remove screws (12). Take bearing retainer (11), washer (14), piston (15), preformed packing (16), plunger (17) and spring (20) out of body (24).
- H. Straighten tang on valve stem assembly (18) and remove valve stem assembly and washer (19) from plunger (17).
- I. Remove screws (22) and take detent guide (21) out of body (24). Remove filter (23) to complete disassembly.

### 4. Cleaning

WARNING: DO NOT USE OIL, OR ANY MATERIAL CONTAINING OIL, IN CONNECTION WITH OXYGEN EQUIPMENT. OIL, EVEN IN MINUTE QUANTITY, COMING IN CONTACT WITH OXYGEN, MAY CAUSE AN EXPLOSION WITH SERIOUS RESULTS. DUST, LINT, OR FINE METAL PARTICLES (FILINGS) ARE ALSO DANGEROUS.

- A. Remove dirt and foreign particles from filters and various components by wiping with a lint-free cloth or by blowing with clean oil-free air or nitrogen. Parts which have become contaminated with grease should be dipped in a container of clean trichlorethylene, Specification MIL-T-7003.

### 5. Inspection

- A. Visually inspect all parts for cracks, nicks or burrs which might cause malfunction of the valve.

### 6. Repair and Replacement

- A. Repair of parts is not recommended. If a part is in need of repair, discard it and procure a new part.
- B. Replace all preformed packings, washers and the valve stem assembly.

### 7. Assembly (see Figure 5)



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NOTE: The instructions listed herein apply to part numbers 8999, 8999-1, -3, -5, and -7. Refer to the index of Figure 5 to find part variations between the valves.

- A. Lubricate all preformed packing with Fluorolube Grade S-362 lubricant, manufactured by Hooker Electro Chemical Company.
- B. Install filter (23) in body (24).
- C. Place detent guide (21) in body (24) and attach with screws (22).
- D. Place washer (19) on valve stem assembly (18) and place this assembly in plunger (17). Bend tangs of valve stem assembly outward to retain it in the plunger, but allowing for valve stem to turn freely.
- E. Position spring (20) and plunger (17) with assembled parts in body (24).
- F. Place preformed packing (16) on piston (15). Press piston (15) into body (24). The extending lugs on plunger (17) must be mated with the slots in detent guide (21).
- G. Place washer (14) over piston (15). Install bearing retainer (11) with screws (12). Locate the retainer so that pin (13) is positioned as shown in Figure 3.
- H. Place preformed packing (10) on insert (9). Press this assembly into piston (15).
- I. Install spring latch (6) on -3, -5 and -7 models; install lever (5), spacer (4) and nameplate (3) with screws (7) and washers (8). Note correct positioning per Figure 3.

### 8. Testing (see Figure 3)

#### A. Proof Pressure and Leakage Test

- (1) Cap valve insert (5) and place valve lever (8) in the ON position.
- (2) Apply oxygen at 200 psi to inlet port (1). Maintain this pressure for two minutes. There must be no evidence of permanent deformation. With pressure applied as above, check for external leakage by immersing the valve in clean water. There shall be no evidence of leakage.



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TROUBLE SHOOTING (see Figure 5)		
Trouble	Probable Cause	Remedy
Leakage out of valve insert.	Faulty valve stem assembly (18).	Replace
Leakage out of valve insert opening in piston.	Faulty preformed packing (10).	Replace
Leakage at seams of valve assembly.	Faulty preformed packing (16).	Replace
Detent stops fail.	Faulty spring (20).	Replace
Insufficient force required to rotate valve lever.	Faulty spring (20).	Replace
	Excessive clearance between parts.	Replace defective parts.
Excessive force required to rotate valve lever.	Spring (20) too strong.	Replace
	Pinched preformed packing (16).	Replace
	Foreign matter in body.	Disassemble and Clean
Insufficient flow in open position.	Clogged hole in piston (15).	Clean
	Clogged filter (23).	Clean
	Orifice in valve insert (9) clogged.	Clean
	Orifice in valve insert too small.	Replace valve insert
Excessive flow in open position.	Orifice in valve insert (9) too large.	Replace valve insert

- (3) Remove the cap from the valve insert. Place lever (8) in the OFF position.
- (4) Apply 100 psi oxygen to the valve inlet. Maintain this pressure for two minutes and check for leakage as above. There shall be no evidence of leakage.





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B. Operation Test

- (1) Apply 100 psi oxygen to the valve inlet. Cycle the valve lever through its entire stroke five times. There must not be any evidence of binding, sticking or other malfunction during any part of the stroke after latch spring is unhooked from OFF position pin.
- (2) For Valve Assy, 8999 and 8999-1, place valve lever (8) in the OFF position. With no pressure applied to the valve inlet, apply a torque of not less than 1 pound to the lanyard holder at center line of lanyard (11). This torque must move the lever from OFF to ON.

Place the valve lever in the OFF position. With 100 psi applied to the valve inlet, apply a torque of no more than 4 pounds to the lanyard holder at center line of lanyard (11). This torque must move the lever from OFF to ON.

- (3) For Valve Assy, 8999-3, -5 and -7, place valve lever (8) in the OFF position. With no pressure applied to the valve inlet, apply a torque of not less than 2 inch pounds to the valve lever. This torque must move the lever from OFF to ON.

Place the valve lever in the OFF position. With 100 psi applied to the valve inlet, apply a torque of no more than 9 inch pounds to the valve lever. This torque must move lever from OFF to ON.

C. General Operation

- (1) Rotate the valve lever to the full closed and full open positions. The stop pin must prevent further rotation.
- (2) Rotate the valve lever from full ON to full OFF detent. Latch spring must engage pin.

Oxygen Inlet Pressure	Flow - LPM at 740 mm. Hg. Abs.	Flow - LPM at 760 mm. Hg. Abs.
Part Number 8999, 8999-3, 8999-7		
20 psi	3.04 to 3.44	3.0 to 3.4
30 psi	3.85 to 4.42	3.8 to 4.36
40 psi	4.72 to 5.37	4.66 to 5.3
50 psi	5.57 to 6.38	5.5 to 6.3
Part Number 8999-1, 8999-5		
20 psi	6.0 to 6.99	5.92 to 6.9
30 psi	7.7 to 8.9	7.6 to 8.8
40 psi	9.36 to 10.89	9.24 to 10.75
50 psi	*10.98 to 12.84 **11.07 to 12.84	10.92 to 12.68

\*Applies to 8999-1 Only

\*\*Applies to 8999-5 only

Flow Requirements  
Figure 4



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### D. Test for Flow

- (1) Apply the oxygen pressures listed in Figure 4 to the valve inlet. Fully open the valve and measure the flow leaving the valve insert. Oxygen flow at the various inlet pressures must fall into the range shown in Figure 4.

### 9. Storage Instructions

- A. Install caplugs on the valve inlet and outlet and wrap the valve to prevent dust from entering the assembly. Do not use any preservative coatings. The valve must be overhauled every two years regardless of use.

### 10. Special Tools

- A. No special tools are required to overhaul this equipment.

### 11. Illustrated Parts List

- A. This Illustrated Parts List covers part numbers 8999, 8999-1, -3, -5, and -7 Oxygen Shut Off Valve Assemblies.

#### B. Group Assembly Parts List

- (1) The Group Assembly Parts List consists of parts listing and a completely indexed exploded view drawing. Each assembly listed is followed immediately by its component parts, properly indented thereunder, to show their relationship to the assembly.
- (2) The quantities listed in the "Units Per Assembly" column are the total quantity used per valve at the location indicated.
- (3) Parts used on only one part number valve are indicated by a letter symbol immediately following the description of a part in the "Usage Code" column. An explanation of the letter symbols used is outlined below. In cases where the "Usage Code" column has been left blank, parts listed are common to all valves.

PART NUMBER

USAGE CODE

8999

A



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### PART NUMBER                      USAGE CODE

8999-1	B
8999-3	C
8999-5	D
8999-7	E

- (4) The part numbers listed in the "Part Number" column are Scott Aviation Corporation part numbers except for Army-Navy standard parts which are listed by Army-Navy standard part number.

### C. How to use this Illustrated Parts List

- (1) If neither the part number nor the nomenclature is known, the part can be found by comparison with the exploded view illustration. When located on the illustration, the index number will refer to the line in the Group Assembly Parts List with the part number and the nomenclature.
- (2) If the part number is known, and it is desired to find the nomenclature or illustration, locate the part number in the appropriate column of the Group Assembly Parts List. The next column gives the nomenclature and the index number refers to the part in the exploded view drawing.

Fig. & Index No.	Part Number	1 2 3 4 5 6 7 Nomenclature	Usage Code	Units Per Assy
5-	8999	Oxygen Shut Off Valve Assembly.....	A	1
	8999-1	Oxygen Shut Off Valve Assembly.....	B	1
	8999-3	Oxygen Shut Off Valve Assembly.....	C	1
	8999-5	Oxygen Shut Off Valve Assembly.....	D	1
	8999-7	Oxygen Shut Off Valve Assembly.....	E	1
-1	2805-3/16 SC	. Cap - Plug.....		1
-2	2805-PD40	. Cap - Plug.....		1
-3	9055	. Plate - Name.....	A	1
	9055-1	. Plate - Name.....	B	1
	9055-3	. Plate - Identification.....	C	1
	9055-5	. Plate - Identification.....	D	1
	9055-7	. Plate - Identification.....	E	1
-4	20154	. Spacer.....		1
-5	9054	. Lever - Valve.....	A, B, C, D	1
	9054-5	. Lever - Valve.....	E	1

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April 15, 1961

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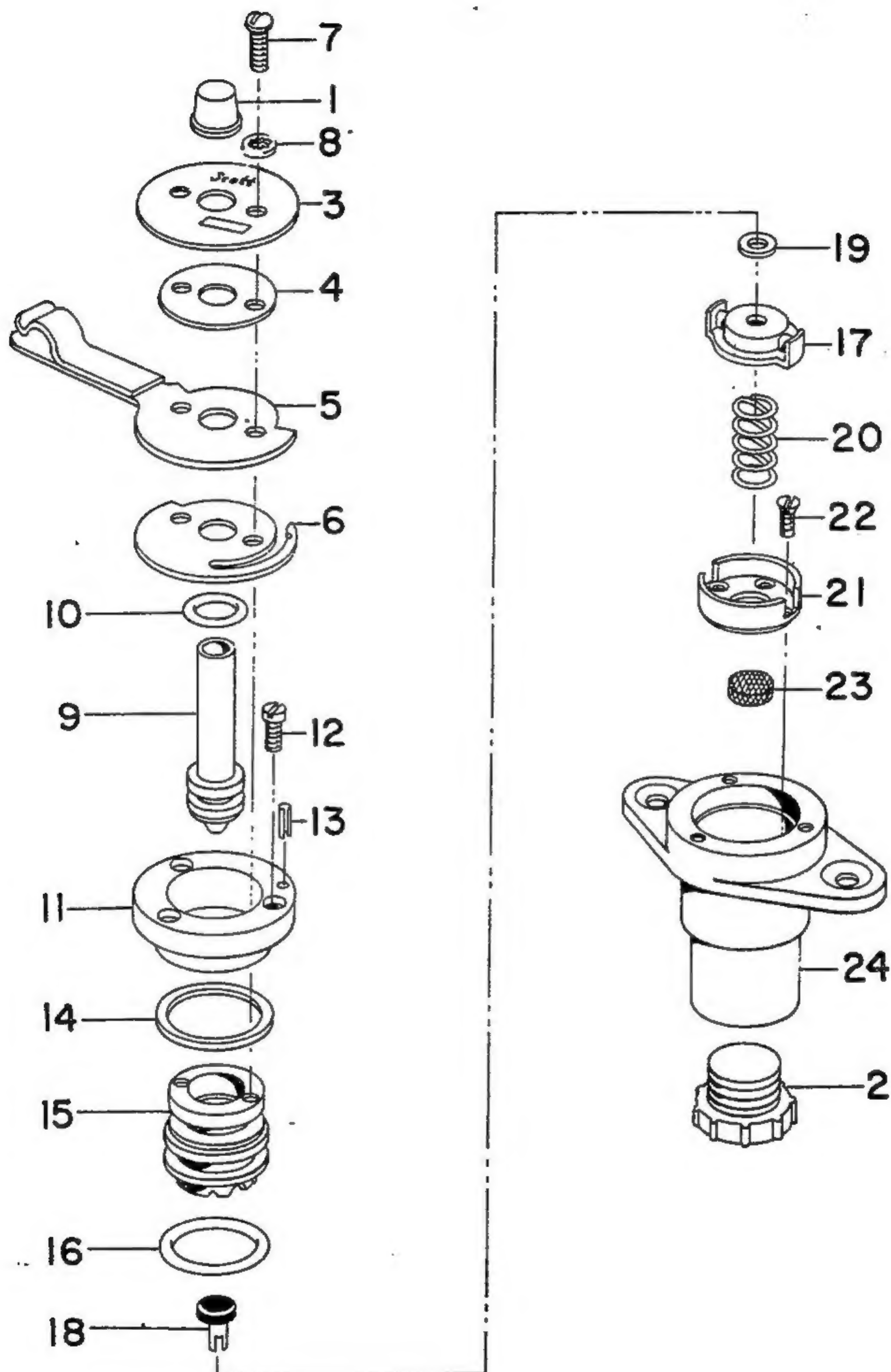
Fig. & Index No.	Part Number	1 2 3 4 5 6 7 Nomenclature	Usage Code	Units Per Assy
5- 6	23311-1	. Latch - Spring..... (ATTACHING PARTS)	C, D, E	1
- 7	AN515-4-4	. Screw - Round Head.....		2
- 8	AN936A4	. Washer - Tooth Lock..... -----*-----		2
- 9	9056-1	. Insert - Valve.....	B, D	1
	9056-2	. Insert - Valve.....	A, C, E	1
-10	2800A3A	. Packing - Preformed.....		1
-11	9053	. Retainer - Bearing..... (ATTACHING PARTS)		1
-12	AN500-2-3	. Screw - Filister Head..... -----*-----		3
-13	6748	. Pin.....		1
-14	21055	. Washer.....		1
-15	9052	. Piston.....		1
-16	MS9021-016	. Packing - Preformed.....		1
-17	9050	. Plunger.....		1
-18	9062	. Valve Stem Assembly.....		1
-19	AN960PD2	. Washer.....		1
-20	9048	. Spring.....		1
-21	9061	. Guide - Detent..... (ATTACHING PARTS)		1
-22	AN510-02	. Screw - Filister head..... -----*-----		1
-23	8938	. Filter.....		1
-24	9047	. Body - Valve.....		1



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Oxygen Shut Off Valve Assembly, Part Number 8999 (typical), Exploded View)  
Figure 5